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On the Rates of Premium to be charged for Assurances on the Lives of Military Officers serving in Bengal. By CHARLES JELLICOE, Esq., one of the Vice-Presidents of the Institute of Actuaries, and Actuary to the Eagle Insurance Company.

[Read before the Institute of Actuaries, 25th of February, 1851.]

THAT the mean duration of life amongst the indigenous inhabitants of one part of the globe differs more or less from that which obtains amongst those of other parts, there is every reason to believe. It is probable that a difference exists even when comparing the most civilized nations of Europe one with another; and still more may we look for discrepancies when we carry our investigations amongst the natives of more remote and less civilized lands.

The climate, extent of cultivation, modes of life, state of public morals, each and all of them have a tendency to affect the longevity of the human race, and will not fail to make their influence felt in proportion as their good or evil energies are called into existence.

But materially as this inquiry concerns the interests of the life assurance companies of this country, it is almost of little importance when compared with that which has to do with the determination of the mean duration of life amongst our own migratory or emigrant population. For one foreigner whose life is insured in this country, there are probably thousands of our own countrymen resident abroad who are so circumstanced ; and tempted as the latter are to leave the mother-country, not only by their own restless and migratory habits, but by the lucrative employments afforded by our numerous colonial possessions, it is likely that some such proportion will still prevail for many years to come.

To arrive, however, at anything like an accurate solution of this problem, even when the contingencies are confined within comparatively narrow limits, is by no means an easy task ; and were it not for circumstances of an accidental character, would be all but impossible till the data arising from the experience of the offices themselves should be forthcoming ; but it fortunately happens, that in one or two instances, and those of more than ordinary importance, the regulations attendant upon the emigration go far to supply the means of arriving at least at an approximation to the truth. This is more particularly the case as regards our countrymen proceeding to India, either in a civil or

military capacity ; the records of the East India Company containing more or less all the particulars with reference to them which an assurance office would register for the purpose in question. These records, although inaccessible to the public generally, have been rendered available, in the first instance by Messrs. Dodwell and Miles, and more recently by Mr. Neison in his elaborate Report upon the Bengal Military Fund. The work of Messrs. Dodwell and Miles was published about the year 1838, and contains an alphabetical list of the officers of the Indian army, with the dates of their respective promotion, retirement, resignation or death, whether in India or Europe, from the year 1760 to the year 1834. It was on this that Mr. Woolhouse founded his well-known estimate of the law of mortality in the Indian army ; and he speaks of the publication as bearing evidence of great care and accuracy.

Mr. Neison's Report was published in 1849*. Having been called upon to investigate the condition of the Bengal Military Fund, he, in the course of his preliminary inquiries, saw, as he states, reason to doubt the sufficiency of the data as collected by Messrs. Dodwell and Miles ; and, moreover, *found it impossible to trace the connexion between the data and the tables constructed from them by Mr. Woolhouse and Mr. Davies.* He accordingly made application at the India House for abstracts from the original records, and was ultimately permitted to make them himself. From these documents he obtained with vast labour the date of the appointment of each cadet, and his age at that date, verified by a certificate of birth ; the date of his retirement, resignation, dismissal or death ; of his being invalidated, pensioned, cashiered or struck off. After a minute and careful comparison of the facts, Mr. Neison was led to confine his observations to the appointments subsequent to the year 1799. He adduces strong evidence to show that "a gradual and important improvement has taken place in the duration of life among the officers in India, even during the present century," arising, it may be presumed, from improved habits of life, a change in the nature and character of the military duties required, or a better knowledge of the climate and the sanitary precautions necessary in it.

* It is much to be regretted that this Report, as well as that by Mr. Griffith Davies on the same subject, is not more widely circulated. The investigations in both are highly instructive and interesting, not only as regards their object, but the manner in which they are conducted.

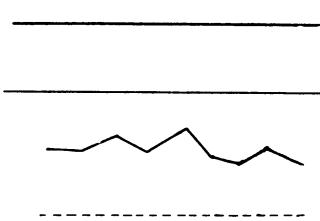
There can be no doubt that the experience is thus rendered more suitable to our time. But the rejection of all the cases prior to 1800 reduces the numbers inconveniently, and of course renders the drawing any useful deduction from a comparison with the observations of Messrs. Dodwell and Miles out of the question. Neither is there any means of testing the accuracy of the results obtained from the observations; but any doubt on this head will probably be removed shortly by Mr. Neison himself, who intimates his intention of publishing the results of his laborious investigation in a separate form.

Limiting, then, his inquiry to the appointments which took place between the 1st of January 1800 and the 31st of December 1847, Mr. Neison gives two tables, from which to deduce the prevailing rate of mortality. In Table I. the observations cease on retirement, resignation, invaliding, being pensioned and being dismissed, *and assuming that a return to Europe is consequent upon each of these events*, this table will evidently yield premiums proper to be charged only during residence in India. In Table IX. the observations are extended over the whole duration of the lives, whether they retire from the service or not, expelled officers only ceasing to be taken account of; and as the number of these is not great, this table will give premiums to be charged during the whole term of life, whether the lives remain in Bengal or return to Europe. In many respects an arrangement of this kind would be much more convenient; but the expectation of a reduction of charge on return to Europe has become so general, that on account of it, and for other reasons, Table I. is better adapted to the purposes of an assurance office. It is to be observed, however, that in neither case would any reduction during residence at home on furlough be justifiable.

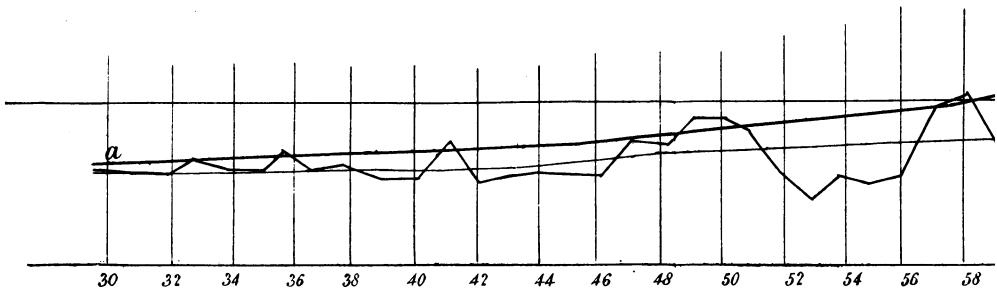
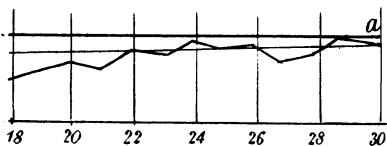
Mr. Neison has himself constructed a table of mortality from the data in Table IX., his objects requiring such an one. I propose in the present paper to deduce premiums from the data in Table I., taking for a basis the figures in the last column of it, that is to say, the mortality per cent. as obtained from actual observation.

I believe that almost all the writers who have adverted to the subject, acknowledge the necessity, or at least the paramount convenience, of introducing a certain degree of regularity into mortality tables greater than is usually exhibited by the facts as simply recorded. Mr. De Morgan, indeed, hints a dislike of the

*Mortality Pr Cent amongst
Officers of the Bengal Army*

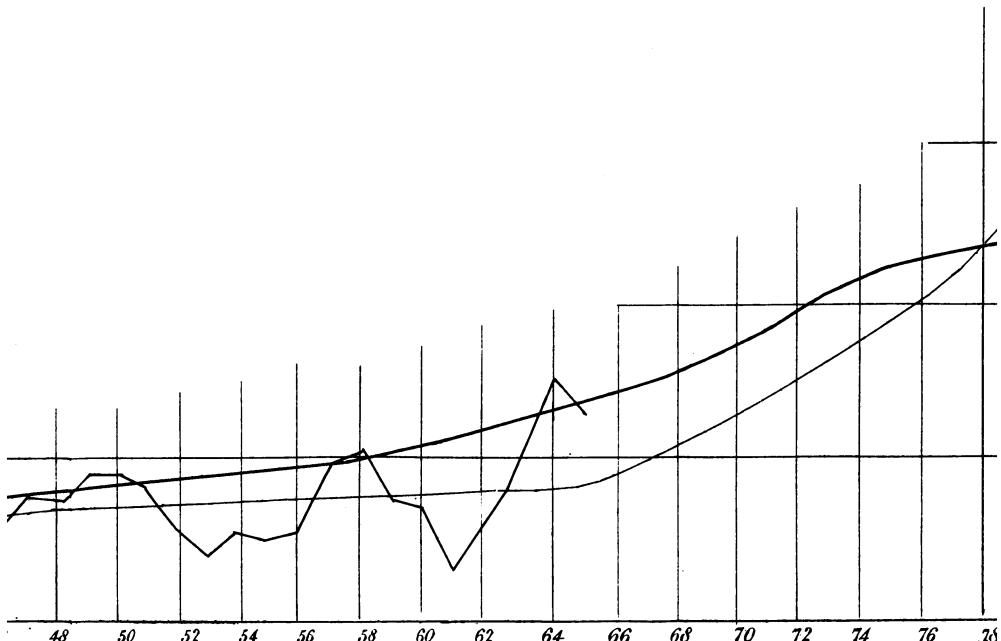


*as deduced by Mr Woolhou
as now deduced from M^r J
as shewn by Mr Neison's Far
as exhibited by the Table*



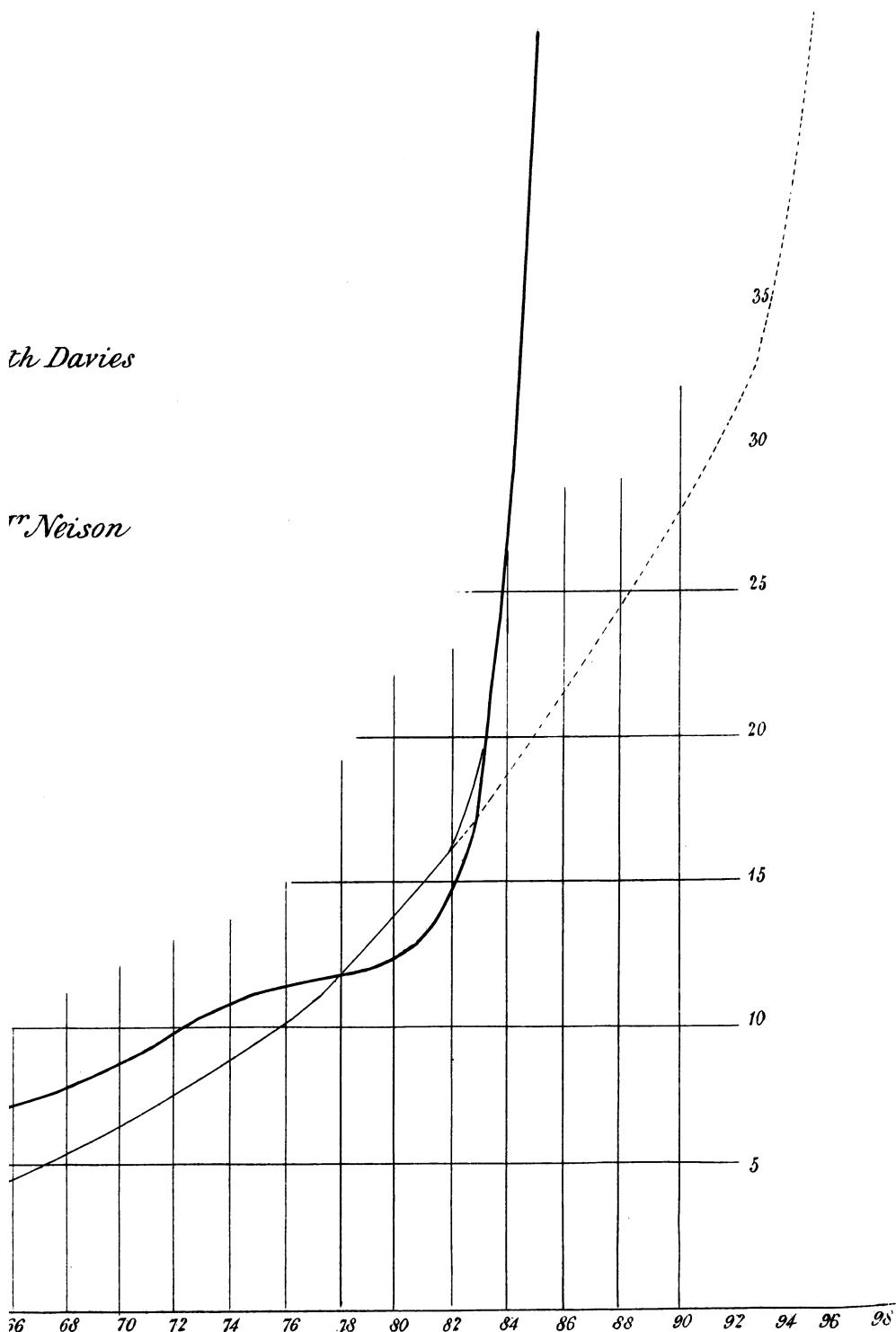
*amongst
gal Army*

*deduced by Mr Woolhouse & Mr Griffith Davies
now deduced from Mr Neison's Table
shewn by Mr Neison's Facts
exhibited by the Table deduced by Mr Neison*



th Davies

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practice, and seems to advocate the correction of the monetary tables, and other similar results, rather than the adjustment of the mortality table in its first stage. Such a mode of proceeding, however, presents so many and such serious inconveniences, that it is hardly likely to be adopted by practical people; and it seems the less to be called for, since the requisite uniformity may be given to the rude results without seriously distorting their proper features. A more crying evil is the insufficiency which so often prevails with regard to the extent of the observations themselves. No one can examine the figures which constitute the basis of the calculations under consideration without coming to the conclusion, that they would have exhibited a very different aspect had the numbers observed upon been greater. Nevertheless, in the absence of more complete records, we can but be guided by those within our reach.

Of the various methods adopted for the construction of mortality tables, there are none, as it appears to me, better than those pointed out by Mr. Farren in his work on Life-Contingency Tables, just published. They have the advantages, heretofore very generally wanting, of consistency and exactness, and leave little or nothing for the arbitrary adjustment of individual computers. In the present case I have selected Mr. Gompertz's method of graduation for the interval between 24 and 64 years of age, as more suitable and less laborious than the interpolation by finite differences. Following Mr. Farren's arrangement, I have first determined the number of survivors which would remain at the ages 34, 44, 54 and 64, supposing the number living at 24 to be subjected to the force of mortality which actually prevailed. I have then determined the numbers living at the intervening ages by Mr. Gompertz's well-known formula $L_x = d \cdot g^x$, changing the constants once only throughout the series. By this process the number of survivors at the above-mentioned decennial epochs remain as at first, whilst the hypothetical principle is fully maintained which stipulates for a rate of mortality increasing in intensity as the age increases; a condition, which, as Mr. Galloway justly observes, "one can scarcely help thinking ought to be fulfilled." The formula and constants used for the number living at any age from 24 to 44 are thus

$$\lambda L_x = 5.01962 - N, \text{ where } \lambda N = [1.9241453 + x.0044078],$$

N

and for the number living at any age from 44 to 64,

$$\lambda L_x = 4.53789 - N, \text{ where } \lambda N = [1.5983634 + x^{\prime}0072977].$$

After the age of 64, Mr. Neison's facts fail; and seeing no better course, I have been fain to adopt a termination to the table corresponding with that given by Mr. Woolhouse, finding no sufficient reason for a greater prolongation of it than he has given, and taking into account that the abruptness of its termination renders the table practically a safer one. In the interval, and as a means of transition, I have adopted the rate given by Mr. Neison in the mortality table derived by him from the data in Table IX. All this will be rendered more apparent by inspection of the diagram appended to this paper. In it is described the curve of mortality per cent. as adjusted by Mr. Woolhouse, the unadjusted one corresponding with Mr. Neison's data, and that now deduced from such data, and coinciding at its close with the curve laid down by Mr. Woolhouse. The diagram also serves to show the direction given to the adjusted curve between the ages 18 and 24.

I have been careful to state these details minutely, lest any obscurity in them should give rise to a want of confidence on that score in the results, and also that any such want, should it arise, may be the more readily traced to its source.

With the aid, then, of the table thus constructed, I have deduced the annual premiums at 4 per cent. for the whole term of life; and, as will be seen, I have also deduced those to be derived from Mr. Woolhouse's table. It will be observed that the difference between them is very considerable, the latter being on the average about 21 per cent. in excess of the former up to the age of 65. This is the more remarkable, inasmuch as Mr. Woolhouse expressly states that he commenced an investigation into the mortality which had prevailed *since the beginning of the year* 1800, and discontinued it because he soon perceived that it would be merely a close verification of that derived from the whole experience; and he was led to conclude from that circumstance, that there was no great fluctuation in the rate, even throughout a long period. On the other hand, it must be remembered, that Mr. Neison's returns come down to the end of 1847, just ten years and three months later than those used by Mr. Woolhouse. But allowing the full effect to this admixture

of more recent experience, the two statements would seem to be scarcely reconcileable.

Under these circumstances, the wiser course would appear to be, to adhere, for the present at least, to the table constructed by Mr. Woolhouse, ratified as it has been by Mr. Griffith Davies*. Should Mr. Neison, with the liberality for which he is distinguished, give publicity to the valuable data he has collected, the offices will be better able to judge of the expediency of adopting them ; and in the meantime they have the satisfaction of learning that they tend fully to confirm the safety at least of their present course. This is so material a consideration, that it necessarily overrules every other, and leads at once, where any room is left for doubt, to the selection of that alternative which carries with it the greater degree of security.

Whilst advocating, however, an adherence to the basis afforded by Mr. Woolhouse's table, I would stipulate for a rather important modification of the manner of forming the actual premiums from it. In a former paper I had occasion to remark upon what I conceive to be the improper mode usually adopted of "loading" the true or net premiums ; now nothing can show in a more forcible manner the inexpediency of the mode of addition by way of a per-centage, than the consequences which result from it, when the "unloaded" premiums are themselves, from the nature of the case, more than ordinarily high. When this occurs, the addition of only a moderate per-centage raises the rate, towards the later periods of life, quite unreasonably, and makes the sum demanded for expenses, &c. altogether preposterous ; as I have before observed, there is no one object for which the payments, over and above those for the risk, are required, which is not of periodical recurrence, that is to say, expenses are incurred, interest is paid, profits are divided, and surplus is returned, at the expiration of certain intervals ; and therefore the provision for these should be made by an equal contribution during those intervals from each of the assured *in a given sum* (for it would stretch the principle rather far to omit this last element). It is true, that if the returns, by way of bonus to the assured, are made on the correct principle, they will get back

* If the facts, as given by Messrs. Dodwell and Miles, could be checked with those in Mr. Neison's possession, the chain of evidence would be unbroken ; and it would be, of course, competent for any one to satisfy himself of the correctness of the deductions from them.

sums in proportion to those they have severally paid ; but there is no good reason why one should be called upon even to advance during the same period more than another for these objects, unless it be the being assured for a larger amount. All this, of course, supposes that the *premium for the risk* is assumed correctly in the first instance, and that the risk itself remains invariable ; and although this may not be strictly true, it is probable that the actual variation is not great during short periods, whilst suitable corrections can be applied at intervals if necessary. This arrangement appears to meet the requirements of the case with sufficient accuracy and with great simplicity. If more be demanded, recourse must be had to those more complicate and recondite considerations which the higher analysis is alone competent to deal with.

Applying then this principle, I have increased the rates yielded by Mr. Woolhouse's table by additions, averaging 25 per cent., at all ages from 18 to 65 ; so that each person assured for £100 pays the like contribution of £1 6s. per annum towards extra contingencies ; and to the premium so increased I have also added a provision for payment of the usual commission. The rates thus formed will be found lower than those usually demanded. Nevertheless I would submit, that they constitute a reasonable and equitable scale under the circumstances of the case.

It now only remains briefly to consider the best course to be pursued when persons who have been assured for some time in Europe are about to proceed to India, and *vice versa*, and are desirous notwithstanding that the assurances on their lives should still remain in force. A little reflection serves to show that the two contracts are so dissimilar in their nature, that scarcely any arrangement can satisfactorily reconcile them. This is particularly the case where the assurance in question has a bonus attached to it. The change from Europe to India *ipso facto* evidently augments the value of such an addition considerably, whilst practically it would be difficult for the assurers to obtain proper compensation for such increased value. The most simple and direct mode of meeting the contingency, appears to me to be to consider the first contract as determined, and to make allowance in the new one for whatever advantage has accrued to the assured on the score of the old ; that is to say, the premium for India being taken in correspondence with the age, at the

time of departure is to be diminished by that equivalent to the value of the original policy; so that if p and A denote the Indian rate of premium and annuity, and v the full value of the policy,

the new rate to be paid will be $p - \frac{v}{1+A}$, the assurance being

thenceforth treated in official calculations as one originating at the time of departure. There is no need to cancel the original policy, the new rate can of course be endorsed upon it, but the allotment of bonus, if there be any, must be recalled.

Precisely the same process would have to be gone through on a return from India to Europe, except that the rate of premium and annuity to be taken in the calculation would be the European ones; and also that it would be desirable, as a matter of precaution, to make an addition to the actual age at the time of return, to compensate for the deterioration caused by the previous foreign residence. From what Mr. Christie and Mr. Neison have shown, it would appear that three years would be more than sufficient for this purpose; and as such an addition would tell with greater effect the greater the age of the individual, it would apparently be not ill adapted to meet the contingency in question. As I have said, these methods appear to me to be the most direct and simple, but no doubt some difficulties would attend them in practice. Very little however has been written on the subject hitherto; and imperfect and unsatisfactory as the practice in reference to it at the present day must be acknowledged to be, the mere attracting attention to it will not, in all probability, be unproductive of advantage.

Irregular Ratios.

Age.	Mortality per cent. by Mr. Neison's Table.	p_x	$\log p_x$	$\log l_x$
18	1·506	.984940	1·9934098	.0000000
19	1·773	.982269	.9922305	.9934098
20	1·955	.980454	.9914273	.9856403
21	1·890	.981104	.9917151	.9770676
22	2·324	.976764	.9897897	.9687827
23	2·345	.976549	.9896941	.9585724
24	2·668	.973323	.9882570	*.9482665*
25	2·457	.975434	.9891979	.9365235
26	2·554	.974461	.9887645	.9257214
27	2·077	.979235	.9908869	.9144859
28	2·253	.977466	.9901016	.9053728
29	2·967	.970335	.9869217	.8954744
30	2·724	.972758	.9880048	.8823961
31	2·593	.974069	.9885898	.8704009
32	2·644	.973565	.9883650	.8589907
33	3·068	.969323	.9864686	.8473557
34	2·777	.972229	.9877686	*.8338243*
35	2·850	.971502	.9874437	.8215929
36	3·260	.967403	.9856075	.8090366
37	2·704	.972965	.9880972	.7946441
38	3·064	.969361	.9864856	.7827413
39	2·573	.974267	.9886780	.7692269
40	2·587	.974128	.9886160	.7579049
41	3·803	.961971	.9831620	.7465209
42	2·363	.976366	.9896126	.7296829
43	2·756	.972437	.9878615	.7192955
44	2·893	.971069	.9872501	*.7071570*
45	2·839	.971611	.9874924	.6944071
46	2·796	.972040	.9876841	.6818995
47	3·903	.960967	.9827085	.6695836
48	3·766	.962343	.9833299	.6522921
49	4·508	.954923	.9799684	.6356220
50	4·468	.955322	.9801498	.6155904
51	4·118	.958824	.9817389	.5957402
52	2·913	.970874	.9871629	.5774791
53	2·162	.978379	.9905072	.5646420
54	2·751	.972495	.9878874	*.5551492*
55	2·637	.973627	.9883926	.5430366
56	2·985	.970149	.9868385	.5314292
57	5·085	.949153	.9773363	.5182677
58	5·448	.945525	.9756730	.4956040
59	3·922	.960784	.9826258	.4712770
60	3·659	.963415	.9838134	.4539028
61	1·695	.983051	.9925760	.4377162
62	4·545	.954546	.9797969	.4302922
63	7·692	.923077	.9652379	.4100891
64	6·250	.937500	1·9719713	*.3753270*

Graduated Ratios.

Log l_x .	Log p_x .	p_x .	Mortality per cent.	Age.
.01066	1.99008	.97742	2.258	18
.00074	.98986	.97692	2.308	19
.99060	.98966	.97647	2.353	20
.98026	.98948	.97607	2.393	21
.96974	.98933	.97572	2.428	22
.95907	.98919	.97542	2.458	23
.94826	.98907	.97515	2.485	24
.93733	.98897	.97492	2.508	25
.92630	.98885	.97465	2.535	26
.91515	.98873	.97438	2.562	27
.90388	.98862	.97414	2.586	28
.89250	.98850	.97387	2.613	29
.88100	.98839	.97362	2.638	30
.86939	.98826	.97333	2.667	31
.85765	.98815	.97308	2.692	32
.84580	.98802	.97279	2.721	33
.83382	.98791	.97254	2.766	34
.82173	.98778	.97225	2.775	35
.80951	.98765	.97196	2.804	36
.79716	.98753	.97170	2.830	37
.78469	.98740	.97141	2.859	38
.77209	.98728	.97113	2.887	39
.75937	.98714	.97082	2.918	40
.74651	.98702	.97055	2.945	41
.73353	.98687	.97022	2.978	42
.72040	.98675	.96995	3.005	43
.70715	.98593	.96812	3.188	44
.69308	.98569	.96758	3.242	45
.67877	.98544	.96703	3.297	46
.66421	.98519	.96647	3.353	47
.64940	.98495	.96593	3.407	48
.63435	.98469	.96536	3.464	49
.61904	.98442	.96476	3.524	50
.60346	.98417	.96421	3.579	51
.58763	.98390	.96360	3.640	52
.57153	.98362	.96298	3.702	53
.55515	.98335	.96238	3.762	54
.53850	.98306	.96174	3.826	55
.52156	.98278	.96112	3.888	56
.50434	.98249	.96048	3.952	57
.48683	.98219	.95983	4.017	58
.46902	.98187	.95912	4.088	59
.45089	.98159	.95849	4.151	60
.43248	.98127	.95778	4.222	61
.41375	.98095	.95708	4.292	62
.39470	.98063	.95637	4.363	63
.37533	1.98014	.95530	4.470	64

Graduated Ratios (continued).

Age.	Log l_x .	Log p_x .	p_x .	Mortality per cent.	Mortality per cent. by Mr. Neison's Table.
65	.35547	1.97914	.95311	4.689	4.692
66	.33461	.97755	.94961	5.039	5.039
67	.31216	.97576	.94572	5.428	5.428
68	.28792	.97378	.94141	5.859	5.859
69	.26170	.97160	.93670	6.330	6.330
70	.23330	.96922	.93157	6.843	6.843
71	.20252	.96663	.92603	7.397	7.397
72	.16915	.96371	.91984	8.016	8.016
73	.13286	.96048	.91301	8.699	8.699
74	.09334	.95691	.90554	9.446	9.446
75	.05025	.95299	.89741	10.259	10.259
76	.00324	.94873	.88865	11.135	11.135
77	.95197	.94414	.87930	12.070	12.070
78	.89611	.93921	.86938	13.062	13.062
79	.83532	.93393	.85888	14.112	14.112
80	.76925	.92829	.84780	15.220	15.220
81	.69754	.92480	.84100	16.385	16.385
82	.62234	.90379	.80128	19.872	17.620
83	.52613	.85898	.72273	27.727	18.924
84	.38511	.74008	.54964	45.036	20.298
85	.12519	1.00000	.00000	100.000	21.740

Bengal Military Mortality, 4 per cent. (From Mr. Neison's data).

Age.	L_x .	D.	N.	Annuity.	Annual premium.
18	10248	5058·700	72309·9012	14·294	2·692
19	10017	4754·488	67555·4132	14·209	2·729
20	9786	4466·202	63089·2112	14·126	2·766
21	9556	4193·498	58895·7132	14·044	2·801
22	9327	3935·574	54960·1392	13·965	2·836
23	9101	3692·513	51267·6262	13·884	2·872
24	8877	3463·104	47804·5222	13·804	2·909
25	8656	3247·013	44557·5092	13·723	2·945
26	8439	3043·853	41513·6562	13·638	2·985
27	8225	2852·569	38661·0872	13·553	3·025
28	8015	2672·818	35988·2692	13·465	3·066
29	7807	2503·322	33484·9472	13·376	3·110
30	7604	2344·457	31140·4902	13·283	3·155
31	7403	2194·693	28945·7972	13·189	3·201
32	7205	2053·843	26891·9542	13·093	3·249
33	7011	1921·673	24970·2812	12·994	3·300
34	6821	1797·689	23172·5922	12·890	3·353
35	6633	1680·901	21491·6912	12·786	3·408
36	6449	1571·420	19921·2712	12·677	3·465
37	6268	1468·572	18452·6992	12·565	3·525
38	6091	1372·210	17080·4892	12·447	3·590
39	5917	1281·746	15798·7432	12·326	3·657
40	5746	1196·827	14601·9162	12·201	3·729
41	5578	1117·150	13483·7662	12·070	3·805
42	5414	1042·601	12441·1652	11·933	3·886
43	5253	972·687	11468·4782	11·791	3·971
44	5093	906·788	10561·6902	11·647	4·061
45	4933	844·519	9717·1712	11·506	4·150
46	4773	785·703	8931·4682	11·367	4·240
47	4616	730·634	8200·8342	11·224	4·334
48	4461	678·941	7521·8932	11·079	4·433
49	4309	630·583	6891·3102	10·928	4·537
50	4160	585·366	6305·9442	10·773	4·648
51	4013	542·963	5762·9812	10·614	4·764
52	3869	503·344	5259·6372	10·449	4·888
53	3729	466·471	4793·1662	10·275	5·023
54	3591	431·932	4361·2342	10·097	5·165
55	3455	399·591	3961·6432	9·914	5·316
56	3323	369·541	3592·1022	9·721	5·481
57	3194	341·535	3250·5672	9·518	5·662
58	3068	315·442	2935·1252	9·305	5·858
59	2945	291·151	2643·9742	9·081	6·073
60	2824	268·449	2375·5252	8·849	6·307
61	2706	247·339	2128·1862	8·604	6·567
62	2593	227·895	1900·2912	8·338	6·862
63	2481	209·664	1690·6272	8·063	7·187
64	2373	192·825	1497·8022	7·767	7·560
65	2267	177·128	1320·6742	7·456	7·980
66	2161	162·351	1158·3232		
67	2052	148·232	1010·0912		205·126
68	1941	134·821	875·2702		
69	1827	122·021	753·2492		
70	1711	109·878	643·3712		
71	1594	98·428	544·9432		
72	1476	87·636	457·3072		
73	1358	77·529	379·7782		
74	1240	68·070	311·7082		
75	1123	59·276	252·4322		
76	1008	51·160	201·2722		
77	895	43·6769	157·5953		
78	787	36·9291	120·6662		
79	684	30·8621	89·8041		
80	588	25·5097	64·2944		
81	498	20·7745	43·5199		
82	419	16·8065	26·7134		
83	336	12·9592	13·7542		
84	243	9·0116	4·7426		
85	133	4·7426			

Bengal Military Mortality, 4 per cent. (Mr. Woolhouse).

Age.	Lx.	D.	N.	Annuity.	Annual premium.	Premiums to be charged.
18	100000	49362-835	668638-910	13-545	3-029	£4 11 1
19	97319	46191-732	622447-178	13-475	3-062	4 11 10
20	94722	43229-910	579217-268	13-399	3-099	4 12 7
21	92201	40460-918	538756-350	13-315	3-140	4 13 6
22	89745	37868-409	500887-941	13-227	3-185	4 14 5
23	87344	35437-790	465450-151	13-134	3-229	4 15 4
24	84994	33158-015	432292-136	13-037	3-278	4 16 4
25	82691	31018-807	401273-329	12-936	3-330	4 17 5
26	80431	29010-627	372262-702	12-832	3-383	4 18 7
27	78212	27125-250	345137-452	12-724	3-440	4 19 10
28	76030	25354-324	319783-128	12-613	3-500	5 1 1
29	73882	23690-393	296092-735	12-498	3-562	5 2 4
30	71766	22126-820	273965-915	12-382	3-627	5 3 8
31	69679	20657-085	253308-830	12-263	3-694	5 5 1
32	67622	19276-218	234032-612	12-141	3-764	5 6 7
33	65594	17978-962	216053-650	12-017	3-836	5 8 1
34	63596	16760-889	199292-761	11-890	3-912	5 9 7
35	61629	15617-768	183674-993	11-761	3-990	5 11 4
36	59691	14544-860	169130-133	11-628	4-073	5 13 1
37	57782	13538-168	155591-965	11-493	4-158	5 14 11
38	55902	12593-935	142998-030	11-355	4-248	5 16 10
39	54050	11708-370	131289-660	11-213	4-342	5 18 9
40	52225	10877-917	120411-743	11-069	4-440	6 0 10
41	50428	10099-637	110312-106	10-922	4-542	6 2 11
42	48657	9370-140	100941-966	10-773	4-648	6 5 3
43	46912	8686-632	92255-334	10-620	4-760	6 7 7
44	45195	8046-826	84208-508	10-465	4-876	6 10 0
45	43507	7448-349	76760-159	10-306	4-999	6 12 7
46	41848	6888-780	69871-379	10-143	5-128	6 15 4
47	40219	6365-986	63505-393	9-976	5-265	6 18 2
48	38621	5877-931	57627-462	9-804	5-410	7 1 3
49	37052	5422-249	52205-213	9-628	5-563	7 4 6
50	35513	4997-143	47208-070	9-447	5-726	7 7 11
51	34062	4600-506	42607-564	9-261	5-900	7 11 7
52	32519	4230-630	38376-934	9-071	6-083	7 15 5
53	31062	3885-652	34491-282	8-877	6-279	7 19 7
54	29629	3563-840	30927-442	8-678	6-487	8 3 11
55	28219	3263-694	27663-748	8-476	6-707	8 8 6
56	26831	2983-812	24679-936	8-271	6-940	8 13 5
57	25466	2723-090	21956-846	8-063	7-188	8 18 8
58	24124	2480-375	19476-471	7-852	7-451	9 4 3
59	22804	2254-477	17221-994	7-639	7-729	9 10 1
60	21507	2044-472	15177-522	7-424	8-025	9 16 4
61	20233	1849-389	13328-133	7-207	8-339	10 2 11
62	18984	1668-486	11659-647	6-988	8-673	10 9 11
63	17760	1500-875	10158-772	6-769	9-026	10 17 4
64	16562	1345-802	8812-970	6-548	9-403	11 5 4
65	15390	1202-468	7610-502	6-329	9-798	11 13 8
66	14246	1070-273	6540-229	6-111		
67	13131	948-563	5591-666	5-895	248-266	£326 19 4
68	12049	836-924	4754-742	5-668		
69	11002	734-807	4019-935	5-471		
70	9991	641-619	3378-316	5-265		
71	9018	556-859	2821-457	5-067		
72	8092	480-461	2340-996	4-872		
73	7224	412-426	1928-570	4-676		
74	6422	352-538	1576-032	4-471		
75	5693	300-499	1275-533	4-245		
76	5038	255-698	1019-835	3-988		
77	4448	217-070	802-765	3-698		
78	3918	183-851	618-914	3-366		
79	3439	155-168	463-746	2-989		
80	3000	130-154	333-592	2-563		
81	2585	107-836	225-756	2-094		
82	2174	87-2024	138-5532	1-589		
83	1742	67-1868	71-3664	1-062		
84	1259	46-6904	24-6760	.528		
85	692	24-6769				